



## CIP Savings in the Dairy Plant

Typical CIP (clean in place) systems use two, three, or even four dedicated tanks that hold rinse and wash solutions. These tanks can range in size from 100 gallons up to, and even greater than, 300 gallons. Most CIP systems have a fresh water tank, an alkaline tank, an acid tank, and a reclaim tank in addition to several pumps and a network of piping that supply and return wash solutions and rinses to and from the equipment being washed in place. They also have a heat supply and a programmer that controls all of the pumps, heat, valves, and chemicals.

Most CIP systems are set up to have a pre-rinse first, then an alkaline wash, followed by a fresh water rinse, then an acid wash, followed by a fresh water rinse, and then a sanitizing step. "One-step" cleaning products provide the following features resulting in saving water, time, energy, and chemical.

1. **Reducing the rinse** following the alkaline wash. Remember, "one-step" cleaners **rinse free** of wash solution **faster** than traditional cleaners.
2. **Elimination of the acid wash** (in some cases alkaline).
3. **Elimination of the fresh water rinse following the acid wash.**

The following is an example of savings generated by implementing a "one step" cleaning program on a CIP system doing 10 washes per day that uses a 200 gallon CIP tank that has a daily make up of 15% and discards the wash solution every six months. These are not theoretical numbers but, in fact, actual real case representations of systems in the field. I have worked with CIP systems four decades and with "one step" cleaning programs for seven years. I must admit I was skeptical at first but, I was quickly convinced of the ability these products to have exceptional cleaning capability while providing significant savings of water, time, energy, and chemical.

### **Total savings:**

1. Water: 2,300 gal/day, 50,600 gal/per month, and 303,600 gal/per six months.
2. Time: 2 hr/day, 44 hr/month, and 264 hr/six months.
3. Energy: 2 hr/day, 44 hr/month, and 264 hr/six months that a pump is not running. 1.7 hr/day, 37 hr/month, and 222 hr/six months you are not heating a solution.
4. Chemical : \$25/day, \$550/month, and \$3,300/six months.

It is important to note, saving time may be the most significant item in this group. Creating more time for an employee or for a production shift can have an enormous impact on productivity. For the employee it opens up opportunities to focus on and accomplish other tasks. For the production shift it may mean the addition of more production time.

Remember, "*New technology is new technology because of the science behind it.*" If you follow the instructions and parameters for using these "one-step" cleaning products they work perfectly.



## Details of Calculating Savings

1. **Reducing the rinse** step time by 20% after the "one-step" wash saves water, time, and energy. Remember, "one-step" cleaners **rinse free** of wash solution **faster** than traditional cleaners.
  - a. Water saved: Reducing a 2 minute rinse by 20% saves 24 seconds per wash. 24 seconds translates to 32 gallons of water per wash. 10 washes per day saves 320 gallons.
  - b. Time saved : 24 seconds saved each wash. 10 washes per day saves 4 minutes.
  - c. Energy saved: Energy saved not running a pump for 4 minutes a day.
  - a. Note: The exact amount of reduction in a rinse can be determined by measuring the pH at the drain during the rinse step. When the rinse water reaches 7.0 pH the rinse is done.
  
2. **Elimination of the acid wash** saves water, time, energy, and chemical.
  - a. Water saved: 20% make up for a 200 gallon tank saves 40 gallons per wash. 10 washes per day saves 400 gallons.
  - b. Time saved: A 10 minute acid wash saves 10 minutes per wash. 10 washes per day saves 100 minutes or 1.67 hours per day.
  - c. Energy saved: Energy costs are difficult to calculate but, each wash saves 10 minutes of heating a wash solution. 10 washes per day saves 1.67 hour per day of heating a wash solution and running a pump.
  - d. Chemical saved: 20% make up for a 200 gallon tank saves 40 gallons per wash. 10 washes per day saves 400 gallons. Charging 400 gallons with acid is about \$25.00 per day.
  
3. **Elimination of fresh water rinse after the acid wash** saves water, time, and energy.
  - a. Water saved: A 2 minute rinse saves 160 gallons of water per wash. 10 washes per day saves 1600 gallons.
  - b. Time saved: A 2 minute rinse saves 2 minutes per wash. 10 washes per day saves 20 minutes.
  - c. Energy saved: Energy saved not running a pump for 20 minutes per day.